

PRESCRIBED FIRE PLAN

Annual Review Sheet

ADMINISTRATIVE UNIT(S): Brookhaven National Lab (BNL)

PRESCRIBED FIRE NAME: Brookhaven National Lab Northeast Units

PREPARED BY: Kathy Schwager **DATE:** 8/27/2012

Reviewed: _____

TECHNICAL REVIEW BY: Bryan Gallagher **DATE:** 9/16/12
NYSDEC

NATURAL RESOURCE REVIEW BY: signature on file **DATE:** 10/22/12
Tim Green

BNL FIRE REVIEW BY: signature on file **DATE:** 10/18/12
Charles LaSalla

EMERGENCY PLANNING

REVIEW BY: signature on file **DATE:** 10/22/12
Michael Venegoni

DOE REVIEW BY: signature on file **DATE:** 10/22/12
Gerald Granzen

COMPLEXITY RATING: LOW

APPROVED BY: signature on file **DATE:** 10/22/12
Frank Crescenzo, DOE-BHSO

APPROVED BY: signature on file **DATE:** 10/22/12
Michael Bebon, BNL

Plan Rewrite: October 2017

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**ELEMENT 1: AGENCY ADMINISTRATOR PRE-IGNITION APPROVAL CHECKLIST – BNL & DOE
ADMINISTRATORS**

Instructions: The Agency Administrator's Pre-Ignition Approval is the intermediate planning review process (i.e. between the Prescribed Fire Complexity Rating System Guide and Go/No-Go Checklist) that shall be completed before a prescribed fire can be implemented. For the purposes of BNL, the agency administrator is Frank Crescenzo for the Department of Energy and Michael Bebon for the Laboratory. The Agency Administrator's Pre-Ignition Approval evaluates whether compliance requirements, Prescribed Fire Plan elements, and internal and external notifications have been or will be completed and expresses the Agency Administrator's intent to implement the Prescribed Fire Plan. If ignition of the prescribed fire is not initiated prior to expiration date determined by the Agency Administrator, a new approval will be required.

YES	NO	KEY ELEMENT QUESTIONS
X		Is the Prescribed Fire Plan up to date? <i>Hints: amendments, seasonality.</i>
X		Will all compliance requirements be completed? <i>Hints: cultural, threatened and endangered species, smoke management, NEPA.</i>
X		Is risk management in place and the residual risk acceptable? <i>Hints: Prescribed Fire Complexity Rating Guide completed with rationale and mitigation measures identified and documented?</i>
X		Will all elements of the Prescribed Fire Plan be met? <i>Hints: Preparation work, mitigation, weather, organization, prescription, contingency resources</i>
X		Will all internal and external notifications and media releases be completed? <i>Hints: Preparedness level restrictions</i>
X		Will key agency staff be fully briefed and understand prescribed fire implementation?
	X	Are there any other extenuating circumstances that would preclude the successful implementation of the plan?
X		Have you determined if and when you are to be notified that contingency actions are being taken? Will this be communicated to the Burn Boss?
		Other:

Recommended by: Tim Green Date: 9/25/2012
Natural Resource Manager, BNL

Approved by: Frank Crescenzo Date: 10/22/12
Frank Crescenzo , DOE-BHSO

Approved by: Mike Bebon Date: 10/22/12
Michael Bebon, BNL

Approval expires (date): 10/22/13

Administrative Unit: BROOKHAVEN NATIONAL LABORATORY

Unit Name: Brookhaven National Lab Northeast Units

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ELEMENT 2: PRESCRIBED FIRE GO/NO-GO CHECKLIST

A. Has the burn unit experienced unusual drought conditions or contain above normal fuel loadings which were not considered in the prescription development? If <u>NO</u> proceed with checklist., if <u>YES</u> go to item B.		YES	NO
B. If <u>YES</u> have appropriate changes been made to the Ignition and Holding plan and the Mop Up and Patrol Plans? If <u>YES</u> , proceed with checklist below, if <u>NO</u> , STOP.			
YES	NO	QUESTIONS	
		Are ALL fire prescription elements met?	
		Are ALL smoke management specifications met?	
		Has ALL required current and projected fire weather forecast been obtained and are they favorable?	
		Are ALL planned operations personnel and equipment on-site, available, and operational?	
		Has the availability of ALL contingency resources been checked, and are they available?	
		Have ALL personnel been briefed on the project objectives, their assignment, safety hazards, escape routes, and safety zones?	
		Have all the pre-burn considerations identified in the Prescribed Fire Plan been completed or addressed?	
		Have ALL the required notifications been made?	
		Are ALL permits and clearances obtained?	
		In your opinion, can the burn be carried out according to the Prescribed Fire Plan and will it meet the planned objective?	

If all the questions were answered "YES" proceed with a test fire. Document the current conditions, location, and results.

Burn Boss

Date

DOE Representative

Date

BNL Representative

Date

Administrative Unit: BROOKHAVEN NATIONAL LABORATORY

Unit Name: Brookhaven National Lab Northeast Units

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ELEMENT 3: COMPLEXITY ANALYSIS SUMMARY

PRESCRIBED FIRE NAME: Northeast Units			
ELEMENT	RISK	POTENTIAL CONSEQUENCE	TECHNICAL DIFFICULTY
1. Potential for escape	L	M	L
2. The number and dependence of activities	L	L	L
3. Off-site Values	L	M	L
4 On-Site Values	L	L	L
5. Fire Behavior	L	M	L
6. Management organization	L	L	L
7. Public and political interest	M	M	L
8. Fire Treatment objectives	L	L	L
9 Constraints	L	L	L
10 Safety	L	M	L
11. Ignition procedures/ methods	L	L	L
12. Interagency coordination	L	L	M
13. Project logistics	L	L	L
14 Smoke management	L	M	L

COMPLEXITY RATING SUMMARY	
	OVERALL RATING
RISK	LOW
CONSEQUENCES	LOW / MODERATE
TECHNICAL DIFFICULTY	LOW
SUMMARY COMPLEXITY DETERMINATION	LOW
<p>RATIONALE: The proposed action requires standard burn methods, coordination, safety mitigation and communication. BNL has a community of private residences to the north and infrastructure to the west and southwest of the unit. These areas are not immediately adjacent to the burn unit. Any fire outside of the intended unit has the potential for containment prior to impacting these values. Contingency planning addresses these potential consequences with staffing for at least one engine or brush truck by the BNL fire department, as well as the ability to receive mutual aid resources provided by local volunteer fire departments (Ridge and Manorville). The safety and risk factors are mitigated by low fuel loading/fuel bed depth and wide roads surrounding unit.</p>	

ELEMENT 4: DESCRIPTION OF PRESCRIBED FIRE AREA

A. Physical Description

1. Location: Brookhaven National Laboratory

Brookhaven National Laboratory ("BNL") is located in Upton, Town of Brookhaven, County of Suffolk, New York. BNL is a federal facility owned by the Department of Energy. The Northeast Units are located in the northeastern corner of BNL. The East Complex is located immediately west of East Fire Break Road and south of North Fire Break Road. The North Complex is located north of the North Fire Break and extends from Pine Bark Path to East Fire Break Road (see maps, Appendix A).

Legal Description: Lat. 40° 53' 27.55" N Long. 72° 51' 6.356" W

2. Total Size: Northeast Units: 170.2 acres (North Complex: 111.2 acres; East Complex: 59 acres)

3. Topography: Northeast Units: flat

4. Project Boundary: Each prescribed fire unit has been divided into subunits. The 4 subunits of the East Complex are each approximately 15 acres in size. The 5 subunits of the North Complex are each approximately 23 acres in size, except for subunit I which is approximately 18.5 acres. Both units are rectangular in shape and, with the exception of subunit I of the North Complex, all are surrounded by woods roads and firebreaks 20 - 80 feet wide on all four sides. Fire vehicles can access all sides of the units.

B. Vegetation/Fuels Description:1. On-site fuels data:

In April 2012, a high intensity wildfire burned through some of the units (see Section 2 for more information on Fire History). The information presented in this section is based on data collected in 2006 and 2007. Once actual tree mortality resulting from the April 2012 wildfire is determined, these data will be updated.

The 170.2 acre project area consists of hardwood forest with a canopy height of from 40 to 60 feet. Overstory species at the site include red oak (*Quercus rubra*), black oak (*Quercus velutina*) and pitch pine (*Pinus rigida*). The average percent density of overstory trees throughout the East Complex consists of 37% live oaks, 42% dead oaks, 19% live pines, and 2% dead pine. The dominant overstory species varies per stand in each subunit (see charts below). The average percent density of overstory trees throughout the North Complex prior to the April 2012 wildfire consisted of 43% live oaks, 21% dead oaks, 32% live pines, and <1% dead pine. The dominant overstory species varies per stand in each subunit.

Note: BA = basal area of tree (the cross sectional area taken at 4.5 feet above ground level)

Subunit	Stand	Species	% Density	BA
A	7	Oak – live	27	20
		Oak – dead	20	7
		Pine – live	53	63

Subunit	Stand	Species	% Density	BA
A	6	Oak – live	69	55

Administrative Unit: BROOKHAVEN NATIONAL LABORATORY

Unit Name: Brookhaven National Lab Northeast Units

		Oak – dead	13	8
		Pine – live	11	23
		Pine – dead	7	5

Subunit	Stand	Species	% Density	BA
B	5	Oak – live	40	54
		Oak – dead	51	25
		Pine – live	4	8
		Pine – dead	5	13

Subunit	Stand	Species	% Density	BA
B	4	Oak – live	45	36
		Oak – dead	38	30
		Pine – live	17	50

Subunit	Stand	Species	% Density	BA
C	3	Oak – live	45	58
		Oak – dead	46	36
		Pine – live	10	28

Subunit	Stand	Species	% Density	BA
D	2	Oak – live	40	30
		Oak – dead	45	20
		Pine – live	16	15

Subunit	Stand	Species	% Density	BA
D	1	Oak – live	21	11
		Oak – dead	28	20
		Pine – live	51	60

Subunit	Stand	Species	% Density	BA
G	11	Oak – live	54	43
		Oak – dead	24	5
		Pine – live	22	23

Subunit	Stand	Species	% Density	BA
G	12	Oak – live	11	14
		Pine – live	89	20

Subunit	Stand	Species	% Density	BA
H	10	Oak – live	24	24
		Oak – dead	47	22
		Pine – live	28	46
		Pine – dead	1	1

Subunit	Stand	Species	% Density	BA
I	8	Oak – live	66	43
		Oak – dead	25	8
		Pine – live	9	13

Subunit	Stand	Species	% Density	BA
I	9	Oak – live	59	46
		Oak – dead	7	7
		Pine – live	11	30

These stands have been affected in the recent past by multiple defoliations by the orange striped oakworm and other insect defoliators, resulting in the high number of dead standing oak snags in the project area—especially in the East Complex subunits (see above).

The understory is dominated by blueberry species (*Vaccinium spp.*), black huckleberry (*Gaylussacia baccata*) and to a lesser extent by black oak. It is moderate in density and averages 25,529 stems per acre (huckleberry/blueberry). The understory layer ranges from 0.1 to 12 feet in height (avg. 2 feet). Slash depth ranged from 0.1 to 10 feet (avg. 7 inches). Leaf litter depth prior to the April 2012 wildfire ranged from 1 to 8 inches (avg. 3 inches). The principal fuels of the forest stands at the burn site will be the leaf litter, portions of the woody understory, and downed woody material. Average weighted fuel bed depth for this unit is 0.41 ft. A custom fuel model has been developed for these units based on down woody fuel (dwf) transects and harvest plots.

2. Fire History:

In April 2012 a high-intensity wildfire burned through subunits G, H, and I of the North Complex and subunit A of the East Complex. In addition, portions of subunit F of the North Complex and subunit B of the East Complex were burned during this fire. Depending on the degree of stand regeneration these subunits may require burning again in the next 5 years. Fuel loads will be evaluated and a determination will be made each year upon review of the plan.

Low-intensity prescribed fires were conducted in the southern-most 8.6 acres of subunit D and in subunit A of the East Complex in October 2006 and October 2011, respectively. Prior to this, most of the subunits had not experienced significant fire since the 1930's.

3. Adjacent fuels data:

Fuels outside the unit are similar in structure and composition to the fuels inside the project area. Overstory fuels east of the firebreak become more dominated by pitch pine and pine

needle litter than inside the unit.

C. Description of Unique Features:

The prescribed fire area is adjacent to an area fenced in to protect a former scientific study site active between 1961 and 1978. This enclosure is just west of the prescribed fire unit on the west side of Old Margin Path (fire break). Inside the enclosure are historical trenching grounds most recently used by the military during World War I and the inner fence and abandoned structures of the scientific study. The East Firebreak Road, as well as the North Firebreak Road, are also the right-of-way for high tension power lines (138 kV and 69kV).

The lack of fire over the last 75 years, has led to a reduction in suitable habitat conditions for a variety of wildlife. The prescribed fire area is currently utilized by white-tailed deer and eastern wild turkey. The habitat potentially could be utilized by whip-poor-will and other migratory songbirds. No threatened or endangered species are known to exist in the unit.

ELEMENT 5: GOALS AND OBJECTIVES

A. Goals:

Maintain a buffer along eastern and northern portions of the lab where hazardous fuels are reduced while the role of fire is restored in maintaining oak-pine and pine-oak forests.

1. Provide for firefighter and public safety (in the event of wildfire) through the reduction of hazardous fuels.
2. Minimize smoke impacts during wildfire events, by conducting prescribed fires when conditions allow for better lift, direction and dispersal, thereby minimizing impacts to sensitive receptors.
3. Gain additional information on smoke behavior in this region of the Central Pine Barrens.
4. Improve conditions that will increase the probability of oak seedling germination and success.
5. Demonstrate differences in seasonality of treatments for both fire behavior and fire effects to enhance effectiveness of future prescribed fire actions.
6. Gain information regarding fire behavior within the treatment unit.
7. Provide training opportunities to enhance the experience of regional interagency prescribed fire and wildfire suppression crews.

B. Objectives:

1. Reduce existing litter, i.e. 1 and 10 hour fuels, by 30 - 90%.
2. Top kill 30 - 90% of the shrub component of the understory.
3. Expose 2 - 30% of bare mineral soil sites over the unit area
4. Monitor and record smoke and fire behavior for future local reference.
5. Provide experience for crew members in ignitions and holding operations and trainee roles.

ELEMENT 6: FUNDING

A. Cost: Contribution of equipment and expendables by partner agencies.

B. Funding source: The burn will be conducted utilizing staff from a combination of cooperating agencies including BNL's Fire/Rescue, New York Wildfire and Incident Management Academy, New York State Department of Environmental Conservation, as well as the US Fish & Wildlife Service. Each respective cooperating agency will cover the costs of their personnel and use of their equipment.

ELEMENT 7: PRESCRIPTION

A. Environmental Prescription:

CHARACTERISTIC	Lower Value	Upper Value
Wind Direction (East Complex & subunits D and E of the North Complex)	NE, N, NW, W, SW	Restricted East and South
Wind Direction (North Complex subunits A, B, C)	N, NW, W	Restricted East and South
Wind Speed (Mid-flame)	0 mph	10 mph
Wind Gusts	0 mph	15 mph
Temperature	30	95
Relative Humidity	30%	70%
1- Hour Fuel Moisture	6%	18%

Mixing Height	1,500'	
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B. Fire Behavior Prescription:

CHARACTERISTIC	Head Fire Growing Season	Backing Fire Growing Season	Head Fire Dormant Season	Backing Fire Dormant Season
FUEL MODEL: Custom FM based on dwf transects, harvest plots, and SO tally @ 6% 1hr, 7% 10hr				
Rate of Spread (chains/hr)	2.8 – 22.3	0.4-0.5	3.6 – 28.1	0.5 – 0.6
Flame Length (ft)	2.7 – 7.1	1.1-1.2	3.1-7.9	1.3

ELEMENT 8: SCHEDULING**A. Ignition Time Frames/Season(s):**

Burn Dates	January 1 – December 31
Time of Day	0900 - 2000 hrs (see constraint below)

Projected Duration: The prescribed fire treatment is not expected to last more than one operational period (typically a workday – nominally up to 12 hours). The ~170-acre prescribed fire area is broken into nine 15-23 acre subunits. In general no more than one subunit may be burned in one operational period. Partial or incompletely burned subunits may be added to the next prescribed burn, so long as the unburned portion is less than 50% of the subunit. The maximum size of a prescribed burn during one operational period is 34 acres.

B. Constraints: Smoke must be directed away from highways and residences; rise sufficiently and disperse to avoid impacts to surrounding areas, including laboratory areas. No prescribed fire will take place if any impairment to BNL's water distribution system exists that would prevent operation of the nearest fire hydrants. No ignition activities will be conducted which would start 30 minutes prior to sunset.

ELEMENT 9: PRE-BURN CONSIDERATIONS**A. Considerations:**

1. On Site: Permits and notifications, internal line construction to separate subunits,

consideration of specific snags to be felled or protected, special features to be protected, weather recording, monitoring. Ensure there are safe travel lanes for interior igniters through any portion of units containing felled snags. Smoke may be visible from nearby buildings. Notify Laboratory personnel.

2. Off Site: Smoke may be visible from adjacent residences. Neighbor notification.

B. Method and Frequency for Obtaining Weather and Smoke Management Forecast(s):

The National Weather Service (NWS) Fire Weather Forecast (Upton Office) will be monitored prior to the burn. The fire weather forecast is prepared and issued daily by the local National Weather Service Forecast Office. On the day of the burn, a Spot Weather Forecast will be obtained from the local NWS Office through an agreement with the NWS Fire Weather Focal Point. The NWSFO-Upton and Fire Weather Focal Point or Public Forecaster can be reached at 1-631-924-0383 or 1-800-226-0217.

The onsite fire weather will be monitored by a crew member.

C. Notifications: Record notifications on contact list (attached).

If the prescribed burn is conducted as part of the NY Wildfire and Incident Management Academy, Academy staff typically issue a press release prior to the burn and the Lab sends postcards to residences immediately to the North and East of the Lab approximately 1 week prior to any burn. Prior to burns conducted outside the Fire Academy postcards will be sent and a press release may be issued prior to the burn season to alert the public and interested parties.

Notifications will be the responsibility of BNL's Natural Resource Manager in conjunction with Community, Education, Government and Public Affairs (CEGPA).

ELEMENT 10: BRIEFING

Briefing Checklist:

- ☐ Burn Organization
- ☐ Burn Objectives
- ☐ Description of Burn Area

- ☐ Expected Weather & Fire Behavior
- ☐ Communications
- ☐ Ignition plan
- ☐ Holding Plan
- ☐ Contingency Plan
- ☐ Wildfire Conversion
- ☐ Safety

ELEMENT 11: ORGANIZATION AND EQUIPMENT

A. Positions: The following is the minimum staffing requirements to implement the prescribed burn. Additional resources may be used as available and assigned positions by the Burn Boss.

A single Burn Boss will oversee the project (RxB2). Two squad bosses will be required to supervise the divisions (FFT1). An additional 7 basic firefighters (FFT2) can fill other positions on the fireline. A minimum of ten personnel total, including the safety officer, will be involved with any prescribed burn.

Personnel may include (but are not limited to) staff from the U.S. Fish & Wildlife Service, National Park Service, New York State Department of Environmental Conservation, U.S. Department of Agriculture, New York State Parks, The Nature Conservancy, BNL Fire Rescue Group, local volunteer firefighters and other qualified individuals. All personnel will have as a minimum in training the fire courses S130/S190 (or equivalent) and physical requirements will include a score of “arduous” (or equivalent) for the pack test for hand crews and a score of “moderate” (or equivalent) via the work capacity test for members of engine crews. (Note: State Agencies have similar requirements for qualifications that are considered appropriate for fire management and prescribed fire.) BNL’s Fire Rescue Group adheres to NFPA fitness

standards which includes an annual test of aerobic capacity using a US Department of Labor Physical Demand Level (PDL) scale. A PDL of “heavy” is typically required for firefighters and those who wish to participate in prescribed fire activities at the Lab will be held to this standard. Those who cannot perform to this standard will not be permitted to participate in prescribed burns.

Organization will be as follows:

Burn Boss - will coordinate and direct the activities during the burn.

Holding Crew 1 - at least a two-person engine crew headed by a squad boss. (Minimum of 3)

Holding Crew 2 - at least a two-person engine crew headed by a squad boss. (Minimum of 3)

Igniters - Minimum of 2

Smoke/Weather Observer - one or more individuals stationed downwind of the fire on alert for spotting or smoke behavior. This lookout may also serve as weather monitor. (Minimum 1)

Safety Officer - this individual is responsible for monitoring the safety operations of and around the fire, and the perimeter area to ensure that unauthorized access does not occur. The Safety Officer monitors fire operations to ensure all workers are conducting operations in a safe manner and to identify safety issues prior to ignition for mitigation and/or avoidance. If ‘normal’ operational safety concerns are identified, this individual notifies the Burn Boss (as warranted) of conditions to determine necessity for shutting down operations. In the event of a concern that is immediately dangerous to life and health, the safety officer may direct the shutdown. This position will be filled by a BNL or DOE representative with fireline qualifications—i.e. having taken at least S-130/190: Basic Firefighting and Wildfire Behavior or equivalent.

B. Equipment:

A minimum of one Type 6 engine.

A minimum of one additional engine consisting of a Type 4, 5, 6, or 7.

A minimum of 4 drip torches.

Equipment will be provided and used as determined by the burn boss and made available through the caches of cooperating agencies. Equipment typically includes (but is not limited to) backpack pumps, council rakes, chain saws, wildland engines, drip torches, etc. Each individual on the fire line shall have proper PPE including Nomex clothing, hard hat, leather boots, eye and ear protection, and fire shelter.

C. Supplies

20-30 gallons of drip torch fuel.

Drinking water.

D. Training Burn:

A small portion of a unit may be burned as part of a live fire training exercise. If the active fire area is less than one acre in size and anchored to roads or previously burned areas fewer crew and equipment will be required. A training exercise may be conducted with one RxB2, one squad boss, and a minimum of 4 additional personnel. One engine and a backup portable pump will be required. Additional engines may take the place of the portable pump. Ecological and fuel management objectives may not be met during a training burn. Note that training burns can be conducted on the “cool side” of the prescription (low winds, high RH, high 1hr fuel moisture) as they are small in nature and primarily for demonstration purposes.

No ecological harm occurs from low intensity prescribed fire which provides optimal conditions for training individuals in basic wildland/prescribed fire techniques.

ELEMENT 12: COMMUNICATION

Radio Frequencies:

At least one radio with backup batteries will be distributed to the burn boss, each holding crew, lookout/smoke spotter and the lead igniter. Radios will also be distributed to each engine. A cellular phone will be on site with the burn boss, smoke spotter and one will be with each squad. Clear text will be used in all communications. Specific communication plans and frequencies will be discussed during briefing and agreed upon by cooperating agencies prior to implementation.

1. Command Frequency(s): to be determined onsite and radio reception verified

2. Tactical Frequency(s): to be determined onsite and radio reception verified
3. Air Operations Frequency(s): to be determined, as needed

Telephone Numbers: BNL Fire Department EMERGENCY: 631-344-2222

BNL Fire-Rescue Duty Captain: 631-344-2351

Tim Green, Natural Resources Manager:

(cell): 631-872-8794

Michael Venegoni, Emergency Management:

(cell): 631-484-2114

Jerry Granzen, DOE-BHSO

(cell): 631-466-1929

Thomas Baldwin, Energy & Utilities Division

(cell) 631-872-5082

Cellular service and radio transmissions will be verified prior to ignition.

ELEMENT 13: PUBLIC AND PERSONNEL SAFETY, MEDICAL

Safety Hazards: Fire behavior, smoke impacts to fireline personnel, tripping, dehydration and fatigue (especially in summer months), significant number of snags inside the unit, pockets of catbrier outside unit, tick borne illness, ground nesting bees.

Measures Taken to Reduce the Hazards: Each individual on the fire line shall have proper PPE including Nomex Clothing, hard hat, leather boots, eye and ear protection, and fire shelter.

Observers shall have Nomex Clothes, hard hat, full coverage foot protection (no open-toed shoes), and eye protection.

Personnel being exposed to smoke should be rotated into positions where the smoke is less (based upon fire behavior and their operational position).

Dehydration and fatigue will be discussed with the firefighters at the crew briefing on burn day. It will be the responsibility of squad bosses to monitor personnel.

Snags along the perimeter of the firebreaks will be assessed and felled as necessary before the burn.

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Equipment will be provided and used as determined by the burn boss and made available through the caches of cooperating agencies. Equipment typically includes (but is not limited to) shovels, pulaskis, swatters, council rakes, chain saws, wildland engines, drip torches, backpack pumps, etc.

Personnel will be aware of tick and bee presence and avoid areas of high bee activity. Personnel will check themselves post-fire to remove ticks within a 24-hour time period.

Hazards and safety issues will be part of the crew briefing to discuss any issues with the on-site team members.

Emergency Medical Procedures: Minor injuries will be handled at the scene. At least one First Aid trained crew member with proper equipment will be on scene.

Major injuries – call 631-344-2222 from cell phone.

Emergency Evacuation Methods: BNL Fire Department will coordinate evacuation (in the event it is necessary). The unit is surrounded by 2-wheel drive dirt roads. There is a heli-spot at the lab if air evacuation is required.

Emergency Facilities:

University Medical Center Stony Brook Emergency Room: 631-689-8333

The following are important contact numbers for emergency communication:

Fire:	BNL Fire Department	344-2222
	Suffolk County Dept. of Fire, Rescue & Emergency Services	924-5252
	New York State DEC Forest Rangers Central Dispatch	877-457-5680
	USFWS Long Island NWR Complex - Office	286-0485
	Manorville Fire Department	878-6614/874-3760
	Brookhaven Town Fire Marshal	451-6262
	Mastic Fire Department	281-2022
	Ridge Fire Department	924-3256/924-4080
Medical:	Suffolk County Fire Communication Center	924-5252

Administrative Unit: BROOKHAVEN NATIONAL LABORATORY

Unit Name: Brookhaven National Lab Northeast Units

University Medical Center Stony Brook	689-8333
Emergency Room (Ext - 1)	

Nearest Phone:	Cellular phone on site	To be assigned
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Other:	National Weather Service Forecast Office – Upton	924-0383
	Long Island Railroad	588-0600
	BNL Sewage Treatment Plant (just SW of the burn)	344-2982

ALL EMERGENCY RESPONSE CAN BE REACHED THROUGH 911, THE ABOVE NUMBERS ARE DIRECT LINES

ELEMENT 14: TEST FIRE

A. Planned location: A test fire will be ignited on the downwind side of the burn unit. If results of the test fire are satisfactory, ignition will continue anchored into the test fire. For example, with prevailing northwest winds during the spring, the test fire would anchor into the southeastern most portion of the prescribed fire area that was burned in October 2006. If the burn is conducted during the summer, with prevailing southerly winds, the test fire would anchor off of North Firebreak Road or other internal control line.

B. Test Fire Documentation:

1. Weather Conditions On-Site: Recorded by weather monitor prior to ignition.
2. Test Fire Results (actual fuel moistures, etc.): Recorded by Burn Boss notes.

ELEMENT 15: IGNITION PLAN

A. Firing Methods: The decision on how the units will be burned is at the discretion of the Prescribed Fire Burn Boss with consideration given to weather parameters, fire behavior and smoke behavior characteristics, control factors, and firefighter safety.

Ignition will be performed from the ground primarily by drip torch application. Firing patterns and directions may change depending on wind direction or other parameters. Pre-determined ground contacts (drop points) along portions of the burn unit will be used to help communicate the progress of ignition operations.

General ignition directions will work from the downwind side and progress into the

predominant wind direction. Fire behavior will be manipulated using various ignition techniques.

B. Devices: The primary ignition source for the burn unit will be hand ignition by drip torch. Fusees and/or a Very pistol with ignition flares may also be used.

C. Techniques: Objectives will be to create a safe and secure black line along the downwind burn unit boundaries while adding fire to the interior portions of the unit. Backing, flanking, and strip fires may be utilized to achieve objectives. Fire behavior will be manipulated using various ignition techniques. Dot, chevron and ring head fires may also be used to achieve desired intensity and rate of spread, depending upon conditions.

D. Sequences: Firing operations will begin on the downwind side of the unit along the control lines (see project map). Ignition along each division will create a 10-30' wide black line working off the downwind burn unit boundaries. Burn Boss and interior igniters will coordinate with holding crews to ensure proper pace and intensity.

E. Patterns: All ignition team members will use good care and communication to ensure safety of all personnel around the burn unit. Strip and dot firing patterns utilizing the contour and prevailing winds may be used to create an even backing, flanking and/or strip head fire through the interior of the burn unit.

F. Ignition Staffing: Two igniters, FFT2 qualifications or higher, will be used during perimeter firing operations. Depending upon conditions, the Burn Boss may use additional igniters in the interior of the unit to achieve objectives.

ELEMENT 16: HOLDING PLAN

General Procedures for Holding: Woods roads surrounding the burn unit will be used as burn unit boundaries for holding operations. Internal control lines constructed prior to ignition may be utilized for burning subunits.

Squad bosses will be responsible for the holding crews and equipment throughout the burn. A minimum of one Type 6 wildland engine, one additional Type 4, 5, 6 or 7 wildland engine, or portable pumps and six backpack pumps will be available to assist in holding activities. A

minimum of three people will be assigned to holding for each division with a minimum of two divisions required for the burn.

Natural and existing barriers (changes in vegetation, burned areas, and trails) will be utilized to contain fire within the burn unit. The Prescribed Fire Burn Boss and squad bosses shall work together to ensure that the ignition pattern and timing do not present any holding concerns on the burn and is coordinated with appropriate holding actions.

Beyond what the wildland engines can carry, the primary water source will be the fire hydrants, which are approximately 1 mile away from the burn unit (see Contingency Map). The secondary water sources may include portable ponds, additional engines and/or water tenders. Just east of First Street on Forest Path is an old concrete draft site. Here, only 0.5 miles from the burn unit, the Peconic River may be used as an additional water source.

All crew members should denote on the project map the divisions, drop points, access roads, water sources, staging areas and other information during the pre-fire briefing.

Critical Holding Points and Actions: Critical holding areas are outside any woods road being used as a firebreak, particularly the enclosed area to the west, which would have access problems associated with it. Concentrated efforts along these boundaries to minimize spread and impacts of any slop-over or spot fires will be taken.

Minimum Organization or Capabilities Needed: The holding crews will consist of a minimum of 2 squad bosses and 4 FFT2's (6 total).

ELEMENT 17: CONTINGENCY PLAN

A. Trigger Points: If spot fires and/or slop-overs cannot be contained with on-scene resources and/or immediately threaten private property, the Burn Boss will declare it a wildfire and contact the BNL Fire Department (631-344-2222) and NYSDEC for assistance.

B. Actions Needed: In the event of a significant spot fire or slop-over, the nearest resource will size up the fire and report size, location, fuels, fire behavior, and recommended tools and personnel needed for containment. Spot fires outside the burn perimeter within the capability of on-scene resources are considered within the prescription. Ignition of the prescribed fire will cease, if safely possible. Resources will be assigned to take appropriate suppression actions on

both the prescribed fire and wildfire until contingency resources arrive on scene.

If the fire is declared a wildfire, an incident command post (ICP) shall be set-up in a safe location. The BNL Fire/Rescue Duty Captain will establish a unified command with the burn boss.

C. Additional Resources and Maximum Response Time(s): If the fire exceeds the capability of the crews on hand and/or immediately threatens private property, a call will be placed for assistance from local resources through the BNL Fire Department. Typical response time for the BNL Fire Department to the outer portions of the site is within 8 minutes. The contingency plan will be reviewed in the crew briefing.

D. STOP WORK AUTHORITY

Any crew member, the Safety Officer, DOE representative, BSA Representative, or BNL Fire Chief shall have “stop work” authority. Anyone who notices safety issues that may threaten life, health or property has the authority to “stop work.” They shall immediately notify either the Safety Officer or the Burn Boss, identify the safety concern, and request that work be stopped to address the concern appropriately.

If no fire has been ignited, the Burn Boss must terminate the burn in an orderly fashion. If ignition of the unit has begun, the Burn Boss will first take steps to contain the prescribed fire in a safe and effective manner. The Burn Boss may need to continue with and/or complete ignition in order to safely and effectively contain the prescribed fire in the shortest amount of time with the least impact to safety and resources. In order to restart a burn, the Go/No Go checklist must be again completed and signed-off on by a DOE Representative and the Natural Resource Manager.

ELEMENT 18: WILDFIRE CONVERSION

A. Wildfire Declared By: Burn Boss

B. IC Assignment: Burn Boss will assume the role of Incident Commander until Unified Command is established and BNL’s Fire/Rescue assumes emergency director duties.

C. Notifications: **Immediate** - BNL Fire Department to dispatch contingency resources.

Secondary (if not present) - Tim Green, Natural Resources Manager at 631-872-8794 and Michael Venegoni, Emergency Management at 631-484-2114 (after contingency resources have been requested). Natural Resources Manager will notify Suffolk County Parks or other public landowners whose property may be threatened.

- D. **Extended Attack Actions and Opportunities to Aid in Fire Suppression:** The Burn Boss will coordinate with the BNL fire chief, or designee, to establish a unified command structure and determine appropriate actions for available resources (personnel and equipment). The unified command may turn down resource assignments if safe and appropriate tactics are not utilized.

ELEMENT 19: SMOKE MANAGEMENT AND AIR QUALITY

A. Compliance: The weather conditions will be monitored throughout the operational period, starting before the test fire is ignited. The smoke dispersal will be monitored through the burn; by the Burn Boss and other burn crew members.

B. Permits to be Obtained: No permits are required to institute a prescribed fire in New York State as long as a Burn Plan that is fully reviewed and approved by NYSDEC is in place. Technical review and a signature verify that a New York State Burn Plan is approved.

C. Smoke Sensitive Areas/Receptors:

Special safety precautions needing attention include the Long Island Railroad tracks to the south of the burn area and the potential for smoke on roads and impacts to BNL facilities to the west and southwest.

The potential for smoke on roads will be addressed by the use of a spotter or observer. The spotter will be mobile and located downwind from the burn unit. Responsibilities will include monitoring roads and railroads, to ensure smoke is not impacting traffic and facilities/residences. If smoke begins to settle or drift at low altitude toward smoke-sensitive areas, rate of burning will be adjusted to ensure lift and dispersal, or the burn will be shut down as soon as safely possible. The smoke spotter will be equipped with a hand-held radio and cell phone and will report directly to the burn boss.

The closest sensitive areas to the burn site are included in the following table. Due to the small

size of the burn area and short burn time, with the proper weather conditions, the smoke produced should dissipate in a short period of time.

D. Impacted Areas:

FEATURE	DIRECTION	DISTANCE (FT)
Long Island Railroad	South	8,600-14,500
RHIC ring	West	600-5,300
Ridge Housing	North	220-5,400
Long Island Expressway	South	10,200-14,300

E. Mitigation Strategies and Techniques to Reduce Smoke Impacts:

NECESSARY TRANSPORT WIND DIRECTION, SPEED AND MIXING HEIGHT

Desired smoke behavior requires good lift and dispersal with low concentrations of smoke. With appropriate lofting conditions (unstable atmospheric conditions) any wind direction will be suitable to transport the smoke away from sensitive areas. A critical component for this burn to ensure adequate mixing and removal of smoke is unstable atmospheric conditions. A minimum mixing height of 1,500' is suggested.

VISIBILITY HAZARDS

If smoke poses a significant visibility hazard (visibility reduced to 0.25 miles or less) over any highway, road or railroad tracks then the fire ignition pattern will be adjusted, ignition suspended and/or the fire will be suppressed until weather conditions change.

ACTIONS TO REDUCE VISIBILITY HAZARDS

A smoke/weather observer will be used in part to monitor smoke conditions. Signs will be

posted, as necessary and appropriate, along roads and within communities on the downwind side of the burn that have the potential to be impacted by smoke.

ELEMENT 20: MONITORING

- A. Fuels Information (forecast and observed) Required Procedures:** Fine dead fuel moisture may be calculated based on spot weather forecast data. The plan calls for fine dead fuel moisture levels between 6% and 18% inclusive in order to initiate the burn.
- B. Weather Monitoring Requirements and Procedures:** The morning of the burn, a spot weather forecast will be obtained from the National Weather Service in Upton. Prior to initiating the burn, wind direction, mid-flame wind speed, temperature and relative humidity data will be collected using a belt weather kit at the burn site.
- C. Fire Behavior Monitoring Required and Procedures:** During the test burn the Burn Boss will confirm appropriate fire behavior. The Burn Boss will communicate with the igniters during firing to monitor fire behavior.
- D. Monitoring Required to Ensure That Prescribed Fire Plan Objectives Are Met:**
Pre-treatment overstory and understory fuels data was collected on each of the subunits. Immediate post fire effects surveys within several days assist in documenting first order fire effects. The growing season after prescribed fire implementation is conducted; post treatment surveys should be conducted.
- E. Smoke Dispersal Monitoring Requirements and Procedures:** See smoke management section for additional details.

ELEMENT 21: POST-BURN ACTIVITIES

Post-burn Activities That Must be Completed: Light rehabilitation of firelines between subunits may be warranted as determined by BNL's Natural Resource Manager. An After Action Review (AAR) will be conducted by the Burn Boss and crew. A post fire report may be used to summarize fire operations, conditions, and monitoring results.

Administrative Unit: BROOKHAVEN NATIONAL LABORATORY

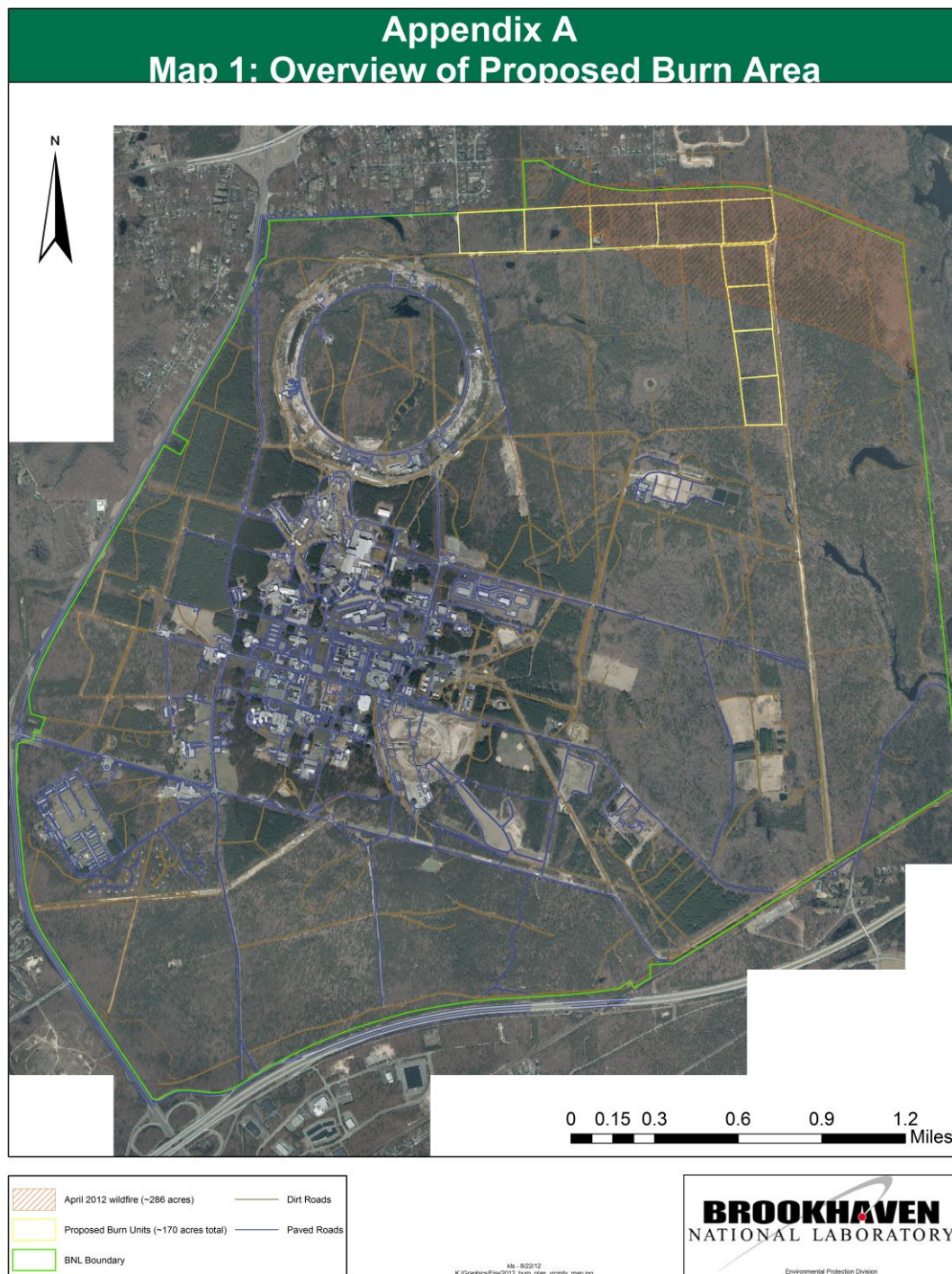
Unit Name: Brookhaven National Lab Northeast Units

APPENDICES

- A. Maps: Vicinity, Project, and Contingency**
- B. Technical Review Checklist**
- C. Complexity Analysis**
- D. Job Hazard Analysis**
- E. Fire Behavior Modeling Documentation or Empirical Documentation (unless it is included in the fire behavior narrative in Element 7; Prescription)**

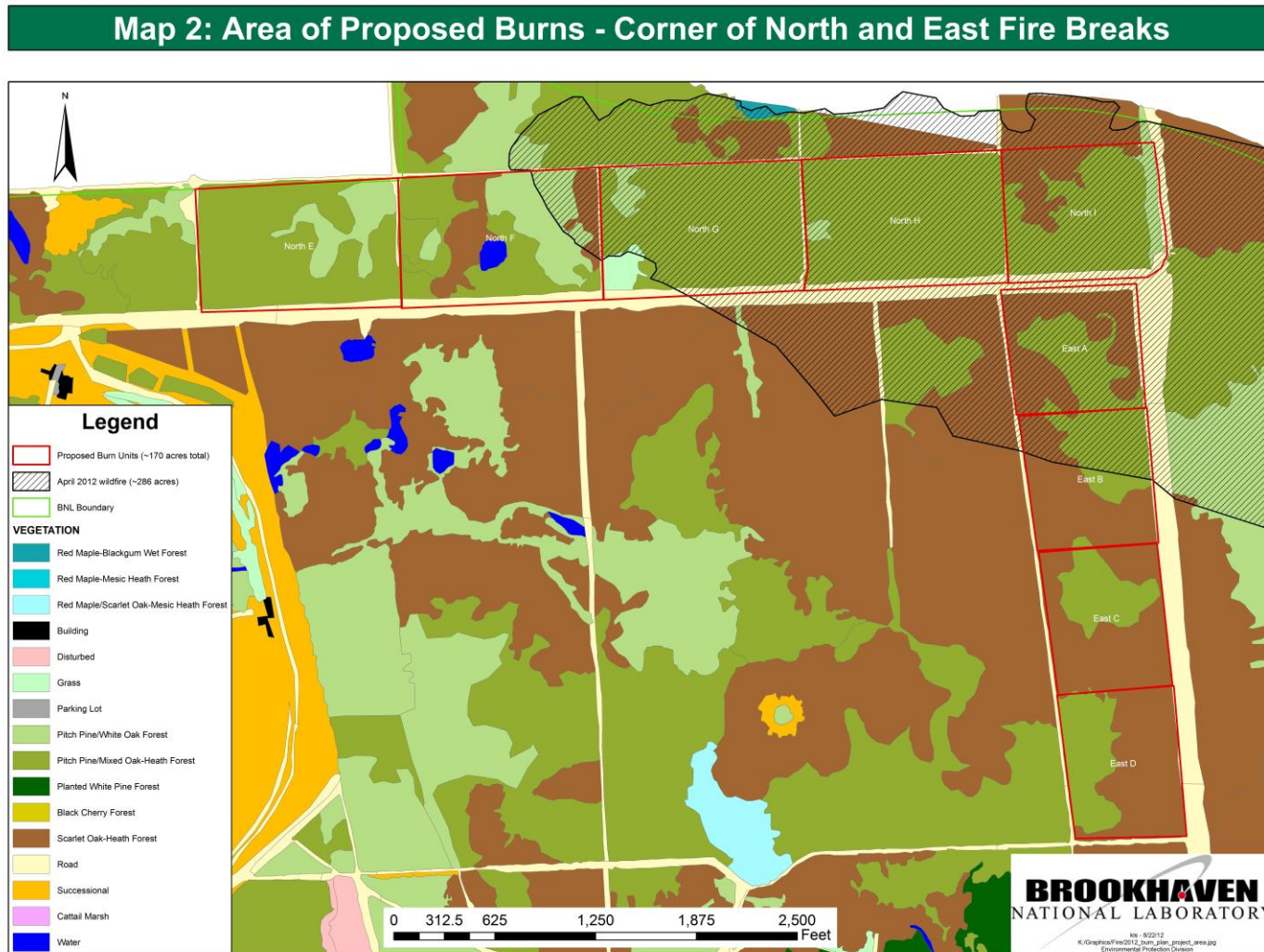
Administrative Unit: BROOKHAVEN NATIONAL LABORATORY

Unit Name: Brookhaven National Lab Northeast Units



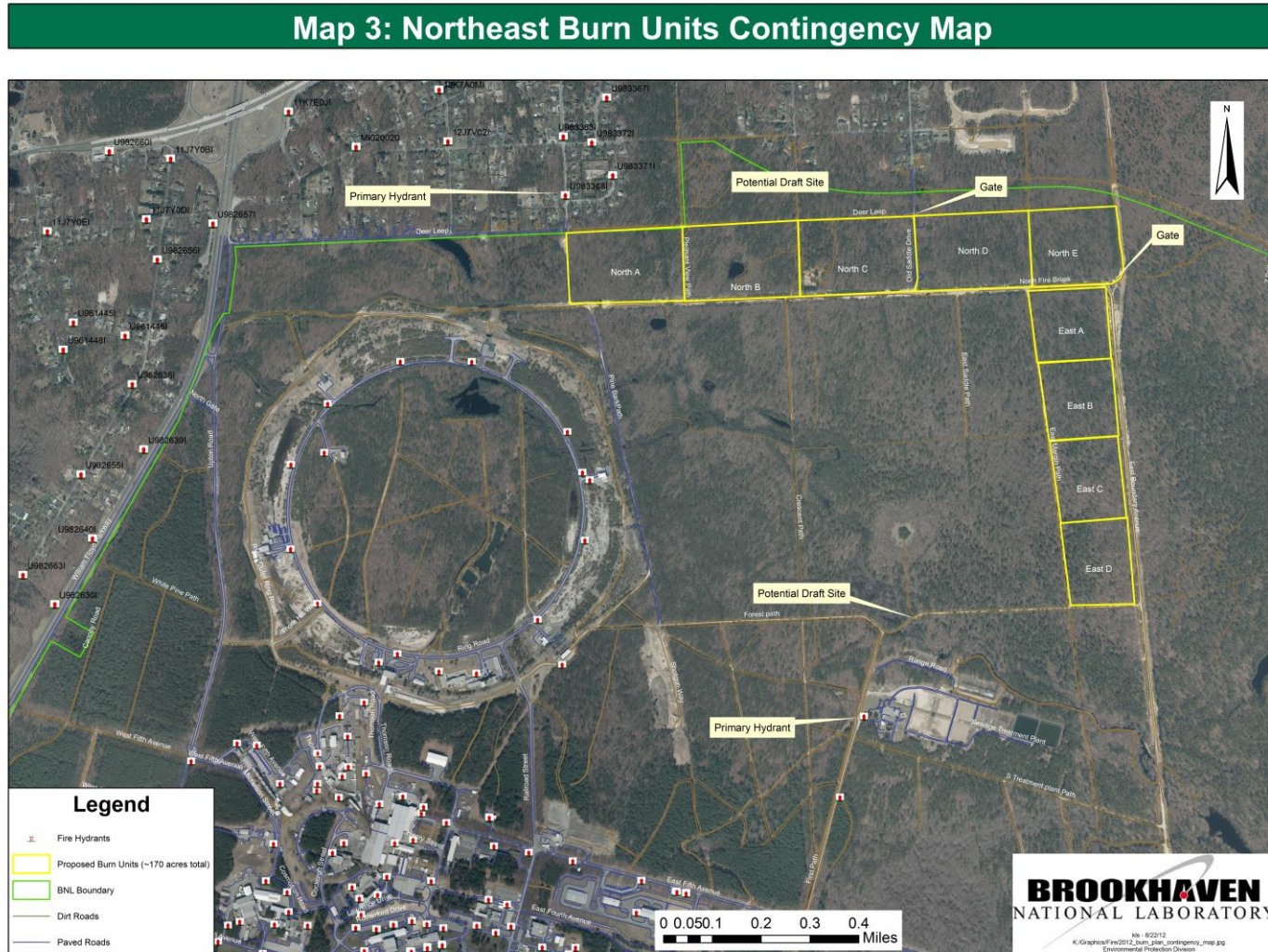
Administrative Unit: BROOKHAVEN NATIONAL LABORATORY

Unit Name: Brookhaven National Lab Northeast Units



Administrative Unit: BROOKHAVEN NATIONAL LABORATORY

Unit Name: Brookhaven National Lab Northeast Units



Appendix B. TECHNICAL REVIEWER CHECKLIST

PRESCRIBED FIRE PLAN ELEMENTS:	S /U	COMMENTS
1. Signature page		
2. GO/NO-GO Checklists		
3. Complexity Analysis Summary		
4. Description of the Prescribed Fire Area		
5. Goals and Objectives		
6. Funding		
7. Prescription		
8. Scheduling		
9. Pre-burn Considerations		
10. Briefing		
11. Organization and Equipment		
12. Communication		
13. Public and Personnel Safety, Medical		
14. Test Fire		
15. Ignition Plan		
16. Holding Plan		
17. Contingency Plan		
18. Wildfire Conversion		
19. Smoke Management and Air Quality		
20. Monitoring		
21. Post-burn Activities		
Appendix A: Maps		
Appendix B: Complexity Analysis		
Appendix C: JHA		
Appendix D: Fire Prediction Modeling Runs		
Other		

S = Satisfactory

U = Unsatisfactory

Recommended for Approval:

Not Recommended for Approval:

 Technical Reviewer Qualification and currency (Y/N) Date

☐ **Approval is recommended subject to the completion of all requirements listed in the comments section, or on the Prescribed Fire Plan.**

Appendix C: COMPLEXITY ANALYSIS**Prescribed Fire Complexity Rating System Guide Worksheet**Instructions: This worksheet is designed to be used with the Prescribed Fire Complexity Rating descriptors on Page 6.Project Name Brookhaven National Lab Northeastern Units Number _____

Complexity elements:

1. Potential for Escape

Risk	Rationale
Preliminary Rating: <div style="background-color: yellow; display: inline-block; padding: 2px;">Low</div> Moderate High	The site is surrounded by roads and firebreaks. There are limited ladder fuels and torching of mature trees not expected to be significant. Similar oak-pine fuels surround the unit. Spots can be extinguished within a reasonable time.
Final Rating: Low Moderate High	
Potential Consequences	Rationale
Preliminary Rating: Low <div style="background-color: yellow; display: inline-block; padding: 2px;">Moderate</div> High	An escape would not damage vegetation, habitat or other values in the immediate area, however there is the potential to impact other properties and structures if initial spot fires are not contained successfully
Final Rating: Low Moderate High	
Technical Difficulty	Rationale
Preliminary Rating: <div style="background-color: yellow; display: inline-block; padding: 2px;">Low</div> Moderate High	Given the low potential for escape, low fuel heights (and lack of ladder fuels), and consistency in fuel loading, a small crew and single Burn Boss can safely accomplish this project.
Final Rating: Low Moderate High	

2. The Number and Dependency of Activities

Risk	Rationale
Preliminary Rating: <div> <div></div> <div>Low</div> <div>Moderate</div> <div>High</div> </div>	Ignition will begin on the downwind side of the unit, establishing blackline along the perimeter and adding additional ignition on the interior to achieve objectives. Holding resources will utilize existing roads and internal breaks.
Final Rating: <div> <div></div> <div>Low</div> <div>Moderate</div> <div>High</div> </div>	
Potential Consequences	Rationale
Preliminary Rating: <div> <div></div> <div>Low</div> <div>Moderate</div> <div>High</div> </div>	The Burn Boss will be coordinating ignition rates and patterns and communicating with the holding resources through face-to-face and radio communication. There are no other concurrent activities in the area and the two holding teams do not have collateral assignments.
Final Rating: <div> <div></div> <div>Low</div> <div>Moderate</div> <div>High</div> </div>	
Technical Difficulty	Rationale
Preliminary Rating: <div> <div></div> <div>Low</div> <div>Moderate</div> <div>High</div> </div>	Communication will be simple. All supervisory staff will have radios with backup batteries available. The unit is relatively flat enabling visual coordination and communication as well.
Final Rating: <div> <div></div> <div>Low</div> <div>Moderate</div> <div>High</div> </div>	

3. Off-Site Values

Risk	Rationale
Preliminary Rating: <u>Low</u> Moderate High	Due to the wide roads and firebreaks risk to structures and improvements (power lines) is low. Fuels inside and outside the unit are similar. There should be little to no visitor usage that would cause a threat to off-site values.
Final Rating: Low Moderate High	
Potential Consequences	Rationale
Preliminary Rating: Low <u>Moderate</u> High	Just outside the burn unit are power lines, a cellular tower and an air monitoring station with good defensible space. If an escape would move off property to the north private property could be impacted. Suffolk County and New York State open space could be impacted to the east. There should be little to no visitor usage. No negative impacts to surrounding vegetation or habitat would be expected if fire were to impact the off-site area.
Final Rating: Low Moderate High	
Technical Difficulty	Rationale
Preliminary Rating: <u>Low</u> Moderate High	The protection of the off-site values should be able to be accomplished with trained crew on scene. No special management, equipment or skills are anticipated to be needed.
Final Rating: Low Moderate High	

4. On-Site Values

Risk	Rationale
Preliminary Rating: <div> <div></div> <div><u>Low</u></div> <div>Moderate</div> <div>High</div> </div>	There are no natural resources at risk in, or near the burn unit that would be negatively affected by the proposed action.
Final Rating: <div> <div>Low</div> <div>Moderate</div> <div>High</div> </div>	
Potential Consequences	Rationale
Preliminary Rating: <div> <div></div> <div><u>Low</u></div> <div>Moderate</div> <div>High</div> </div>	Problems during the prescribed fire are unlikely to impact any unique or significant natural resource.
Final Rating: <div> <div>Low</div> <div>Moderate</div> <div>High</div> </div>	
Technical Difficulty	Rationale
Preliminary Rating: <div> <div></div> <div><u>Low</u></div> <div>Moderate</div> <div>High</div> </div>	No special skills or operating procedures are required. Significant resource damage in the unit is unlikely to occur if suppression of fire is required.
Final Rating: <div> <div>Low</div> <div>Moderate</div> <div>High</div> </div>	

5. Fire Behavior

Risk	Rationale
Preliminary Rating: <div> <div>Low</div> <div>Moderate</div> <div>High</div> </div>	Fuels consist primarily of huckleberry, blueberry, sedge, and oak-pine litter. Fuels are relatively uniform and flat. Fire behavior is expected to be similar throughout the unit. One fuel model should represent the area.
Final Rating: <div> <div>Low</div> <div>Moderate</div> <div>High</div> </div>	
Potential Consequences	Rationale
Preliminary Rating: <div> <div>Low</div> <div>Moderate</div> <div>High</div> </div>	Fuels outside of the unit are similar to those within the unit. Snags shall be monitored as a source of potential embers. Fire behavior east of the unit may have the potential to be more intense due to a higher pitch pine component and some low to moderate slopes.
Final Rating: <div> <div>Low</div> <div>Moderate</div> <div>High</div> </div>	
Technical Difficulty	Rationale
Preliminary Rating: <div> <div>Low</div> <div>Moderate</div> <div>High</div> </div>	Based on the character of the unit, this is not a technically difficult prescription. The number and size of any spot fires should not require additional suppression resources as long as conditions remain within prescription. Slopovers are unlikely due to wide roads and firebreaks. Direct attack tactics should be successful on most spot fires and slopovers.
Final Rating: <div> <div>Low</div> <div>Moderate</div> <div>High</div> </div>	

6. Management Organization

Risk	Rationale
Preliminary Rating: <div style="background-color: yellow; display: inline-block; width: 15px; height: 15px; margin-right: 5px;"></div> <u>Low</u> <i>Moderate</i> <i>High</i>	A single level of supervision (Burn boss, igniters, holders) should be adequate to coordinate ignition and holding operations. A single person may fill several positions (ex. Weather/Smoke). All of the required minimum prescribed fire positions must be staffed with fully qualified personnel.
Final Rating: <i>Low</i> <i>Moderate</i> <i>High</i>	
Potential Consequences	Rationale
Preliminary Rating: <div style="background-color: yellow; display: inline-block; width: 15px; height: 15px; margin-right: 5px;"></div> <u>Low</u> <i>Moderate</i> <i>High</i>	Problems related to supervision or communications are expected to be minimal. Sufficient radios and backup batteries will be available, visual contact can be made and maintained due to the size of the unit, and roads surround the entire management unit.
Final Rating: <i>Low</i> <i>Moderate</i> <i>High</i>	
Technical Difficulty	Rationale
Preliminary Rating: <div style="background-color: yellow; display: inline-block; width: 15px; height: 15px; margin-right: 5px;"></div> <u>Low</u> <i>Moderate</i> <i>High</i>	Primary staff are from the local area and are familiar with fuel types. Outside staff will be briefed about local fire behavior and techniques prior to ignition.
Final Rating: <i>Low</i> <i>Moderate</i> <i>High</i>	

7. Public and Political Interest

Risk	Rationale
Preliminary Rating: <i>Low Moderate High</i>	Smoke from the fire may be visible from adjacent communities and roadways. Some political controversy with animal rights groups have surfaced after past prescribed fire activities, while other environmental groups support the activity. Results of fire program have the interest of partner agencies and media outlets.
Final Rating: <i>Low Moderate High</i>	

Potential Consequences	Rationale
Preliminary Rating: <i>Low Moderate High</i>	Unexpected or adverse events would attract media and political attention that may delay implementation of other similar projects around the area and the DOE complex. Communication planning has helped minimize impacts of unintended events in the past on other properties.
Final Rating: <i>Low Moderate High</i>	
Technical Difficulty	Rationale
Preliminary Rating: <i>Low Moderate High</i>	No special fire information function is required. Standard notification procedures will cover adequate flow of information.
Final Rating: <i>Low Moderate High</i>	

8. Fire Treatment Objectives

Risk	Rationale
Preliminary Rating: <div> <div>Low</div> <div>Moderate</div> <div>High</div> </div>	Fire objectives can be accomplished under a wide variety of conditions. Deep fire or complete duff removal is not necessary. Vegetation and fuels monitoring are conducted prior to and after treatments are applied. Fire weather and behavior are monitored on site during the incident.
Final Rating: <div> <div>Low</div> <div>Moderate</div> <div>High</div> </div>	
Potential Consequences	Rationale
Preliminary Rating: <div> <div>Low</div> <div>Moderate</div> <div>High</div> </div>	Failure to meet objectives in the short term will have few adverse impacts on the natural resources. Fuel reduction objectives can only be accomplished with this activity.
Final Rating: <div> <div>Low</div> <div>Moderate</div> <div>High</div> </div>	
Technical Difficulty	Rationale
Preliminary Rating: <div> <div>Low</div> <div>Moderate</div> <div>High</div> </div>	Pre-treatment monitoring is easy to complete following established protocols. Monitoring during burn by the burn boss will determine rates and intensity of ignition.
Final Rating: <div> <div>Low</div> <div>Moderate</div> <div>High</div> </div>	

9. Constraints

Risk	Rationale
Preliminary Rating: <div> <div></div> <div><u>Low</u></div> <div>Moderate</div> <div>High</div> </div>	Only weather related constraints have been identified at this time. Smoke dispersion needs to be managed to ensure no impacts to roads, residences, and intake fans of accelerator facilities.
Final Rating: <div> <div></div> <div></div> <div></div> <div></div> </div>	
Potential Consequences	Rationale
Preliminary Rating: <div> <div></div> <div><u>Low</u></div> <div>Moderate</div> <div>High</div> </div>	Project can be implemented whenever it is in prescription.
Final Rating: <div> <div></div> <div></div> <div></div> <div></div> </div>	
Technical Difficulty	Rationale
Preliminary Rating: <div> <div></div> <div><u>Low</u></div> <div>Moderate</div> <div>High</div> </div>	Constraints should have little impact on achieving resource management objectives.
Final Rating: <div> <div></div> <div></div> <div></div> <div></div> </div>	

10. Safety

Risk	Rationale
Preliminary Rating: <u>Low</u> Moderate High	<p>Safety issues include fatigue, heat stress, tripping hazards, jackpots of fuel, tick-borne illness, and high percentage of snags within the unit. Internal igniters will need to be aware of hazards. In the event of a spot fire to the west of the unit, cultural resources exist that personnel must consider during suppression activities. Unsound snags near the control line will be felled prior to implementation of prescribed fire.</p>
Final Rating: Low Moderate High	
Potential Consequences	Rationale
Preliminary Rating: Low <u>Moderate</u> High	<p>Most safety issues can be easily mitigated. Internal igniters need continuous attention to snags regarding fire behavior and potential for falling limbs and trunks. Watch heat stress during growing season fires conducted with high temperatures and humidity.</p>
Final Rating: Low Moderate High	
Technical Difficulty	Rationale
Preliminary Rating: <u>Low</u> Moderate High	<p>Attention to LCES addresses the safety concerns identified above.</p>
Final Rating: Low Moderate High	

11. Ignition Procedures/Methods

Risk	Rationale
Preliminary Rating: <div> <div></div> <div><u>Low</u></div> <div>Moderate</div> <div>High</div> </div>	Understory vegetation and topography are low. Burn Boss and squad bosses will be able to maintain visual contact with internal igniters.
Final Rating: <div> <div>Low</div> <div>Moderate</div> <div>High</div> </div>	
Potential Consequences	Rationale
Preliminary Rating: <div> <div></div> <div><u>Low</u></div> <div>Moderate</div> <div>High</div> </div>	Ignition tools and techniques are standard for prescribed fires, so no special training or techniques are needed.
Final Rating: <div> <div>Low</div> <div>Moderate</div> <div>High</div> </div>	
Technical Difficulty	Rationale
Preliminary Rating: <div> <div></div> <div><u>Low</u></div> <div>Moderate</div> <div>High</div> </div>	Although flares or other ignition devices may be used to supplement ignition, primary ignition by drip torches using standard patterns is planned.
Final Rating: <div> <div>Low</div> <div>Moderate</div> <div>High</div> </div>	

12. Interagency Coordination

Risk	Rationale
Preliminary Rating: <div> <div></div> <div><u>Low</u></div> <div>Moderate</div> <div>High</div> </div>	Burn site is entirely within Brookhaven National Lab. State personnel will assist with burn as in past projects. No special coordination will be required. Units may be burned during the New York Wildfire & Incident Management Academy. The Incident Management Team may coordinate activities if conducted during this time period.
Final Rating: <div> <div>Low</div> <div>Moderate</div> <div>High</div> </div>	
Potential Consequences	Rationale
Preliminary Rating: <div> <div></div> <div><u>Low</u></div> <div>Moderate</div> <div>High</div> </div>	Project can be completed as planned. No State or local permits are required as long as project has an approved plan.
Final Rating: <div> <div>Low</div> <div>Moderate</div> <div>High</div> </div>	
Technical Difficulty	Rationale
Preliminary Rating: <div> <div>Low</div> <div><u>Moderate</u></div> <div>High</div> </div>	Project requires the use of a cooperative agreement between BNL and the US Fish & Wildlife Service unless conducted during the NYS Wildfire Academy.
Final Rating: <div> <div>Low</div> <div>Moderate</div> <div>High</div> </div>	

13. Project Logistics

Risk	Rationale
Preliminary Rating: <div> <div></div> <div><u>Low</u></div> <div>Moderate</div> <div>High</div> </div>	No logistical support is anticipated. Supplies are available within each agency. Ignition is expected to be completed in one day with rapid burnout of ignited fuels.
Final Rating: <div> <div></div> <div></div> <div></div> </div> <div> <div>Low</div> <div>Moderate</div> <div>High</div> </div>	
Potential Consequences	Rationale
Preliminary Rating: <div> <div></div> <div><u>Low</u></div> <div>Moderate</div> <div>High</div> </div>	Risk of an escaped fire will not be compromised by logistics.
Final Rating: <div> <div></div> <div></div> <div></div> </div> <div> <div>Low</div> <div>Moderate</div> <div>High</div> </div>	
Technical Difficulty	Rationale
Preliminary Rating: <div> <div></div> <div><u>Low</u></div> <div>Moderate</div> <div>High</div> </div>	No logistical support is anticipated.
Final Rating: <div> <div></div> <div></div> <div></div> </div> <div> <div>Low</div> <div>Moderate</div> <div>High</div> </div>	

14. Smoke Management

Risk	Rationale
Preliminary Rating: <div> <div>Low</div> <div>Moderate</div> <div>High</div> </div>	Smoke impacts will be mitigated by burn location, wind direction, mixing height, short period of burning (1 day), and monitoring. Easterly winds will be restrictive due to potential impacts to accelerator facility intake vents.
Final Rating: <div> <div>Low</div> <div>Moderate</div> <div>High</div> </div>	
Potential Consequences	Rationale
Preliminary Rating: <div> <div>Low</div> <div>Moderate</div> <div>High</div> </div>	Public or firefighter exposure to smoke should be minimal and of short duration. Impacts can be extremely costly if interfering with accelerator facilities.
Final Rating: <div> <div>Low</div> <div>Moderate</div> <div>High</div> </div>	
Technical Difficulty	Rationale
Preliminary Rating: <div> <div>Low</div> <div>Moderate</div> <div>High</div> </div>	Limitations on wind direction and mixing height will be important in planning and implementing burn to mitigate smoke impacts. No other special operational procedures should be required.
Final Rating: <div> <div>Low</div> <div>Moderate</div> <div>High</div> </div>	

Administrative Unit: BROOKHAVEN NATIONAL LABORATORY

Unit Name: Brookhaven National Lab Northeast Units

COMPLEXITY RATING SUMMARY

RISK OVERALL RATING LOW

POTENTIAL CONSEQUENCES OVERALL RATING LOW / MODERATE

TECHNICAL DIFFICULTY OVERALL RATING LOW

SUMMARY COMPLEXITY RATING **LOW**

RATIONALE: The proposed action requires standard burn methods, coordination, safety mitigation and communication. BNL has a few private residences to the north and infrastructure to the west and southwest of the unit. These areas are not immediately adjacent to the burn unit. Any fire outside of the intended unit has the potential for containment prior to impacting these values. Contingency planning addresses these potential consequences with BNL fire department near the burn site and fully staffed. The safety and risk factors are mitigated by low fuel loading/fuel bed depth and wide roads surrounding unit.

Prepared by: Kathy Schwager Date: 08/24/12

Approved by: Tim Green Date: _____

(Agency Administrator)

Appendix D. JOB HAZARD ANALYSIS

			FS-6700-7 (11/99)
U.S. Department of Agriculture Forest Service	1. WORK PROJECT/ACTIVITY Prescribed Burning	2. LOCATION Brookhaven National Laboratory	3. UNIT Northeast Units
JOB HAZARD ANALYSIS (JHA) References-FSH 6709.11 and -12 (Instructions on Reverse)	4. NAME OF ANALYST Kathy Schwager	5. JOB TITLE Staff Engineer	6. DATE PREPARED 07/11/12
7. TASKS/PROCEDURES	8. HAZARDS	9. ABATEMENT ACTIONS Engineering Controls * Substitution * Administrative Controls * PPE	
1. Driving (on paved and unpaved surfaces)	General Operations & Traffic	<ul style="list-style-type: none"> Defensive driving techniques. When driving engines, drive cautiously, being aware of greater stopping distances needed. 	
	Smoke/poor Visibility	<ul style="list-style-type: none"> All wildland engines must have headlights on at all times for maximum visibility. Use light bars and/or warning lights as necessary. 	
	Stuck in Mud/Sand	<ul style="list-style-type: none"> Be aware of known areas and avoid, if possible. Ensure escape routes used by vehicles are drivable. 4-wheel drive. 	
1a. Hauling Flammable Substances	Spills/Exposure	<ul style="list-style-type: none"> Use appropriate containers for hauling gasoline and drip torch fuel and ensure they are properly secured. Wear appropriate PPE. 	
1b. Backing Up/Turning Around	Collisions	<ul style="list-style-type: none"> Any wildland engine backing up must have spotter to assist the driver in backing up safely. 	
1c. Transporting Sharp Tools and Unsecured Loads	Injury	<ul style="list-style-type: none"> Use guards, cages, boxes or tool mounts. Check that loads are properly secured prior to departure; use tie-downs. 	
1d. Parking Near a Prescribed Burn	Escape Fire	<ul style="list-style-type: none"> Leave keys in the ignition, park nose out, close windows. Do not leave flammable materials in bed of vehicle. 	
2. Equipment Set-up	Back Strain/Ergonomics	<ul style="list-style-type: none"> Use proper lifting techniques. 	

	Fuel Spills	<ul style="list-style-type: none"> • Use secondary containment or place absorbent material beneath drip torches, chainsaws, etc. when filling.
3. Holding Operations (including construction of fireline, securing perimeter of fire, and mop-up).	Tripping Hazards	<ul style="list-style-type: none"> • Ensure crew entering interior of unit is aware of tripping hazards and heavy fuels. • Maintain a safe walking distance between people. • Wear PPE at all times. • In heavy undergrowth, lift knees to clear obstacles. Know how to fall—Try to land in the least obstructed spot, protect head and back, roll with the fall, do not stick out your arms to break a fall. • Maintain situational awareness.
	Heat/Cold Stress	<ul style="list-style-type: none"> • Ensure crew briefed regarding consumption of water (~1/2 quart/hour) and food throughout the day. Limit caffeine intake. • Train crew how to recognize early signs of heat/cold stress and inform fireline supervisor. • Rotate arduous tasks when feasible. • For cold stress, proper gloves and cold weather gear should be worn (based on predicted weather).
	Solar UV Radiation	<ul style="list-style-type: none"> • Keep exposed skin covered by wearing a hat, bandana and long-sleeved shirt. • Use sunscreen.
	Eye Injuries	<ul style="list-style-type: none"> • Wear eye protection (safety glasses or goggles) in all phases of operations particularly during mop-up.
	Snags/Hazard Trees	<ul style="list-style-type: none"> • Ensure interior crew maintains situational awareness. • Wear proper PPE at all times to protect against hazard. • Fell snags that may threaten safety of interior igniters as well as those that may threaten personnel on holding lines. Falling and bucking to be done only by trained personnel.

	Tick-borne Illness	<ul style="list-style-type: none"> • Brief crew regarding presence of ticks. • Regular body checks especially after operations are concluding, within 24 hours. • Mitigate by spraying clothing with commercially available permethrin and taping cuffs of pants to boots.
	Ground-nesting Bees	<ul style="list-style-type: none"> • Brief crew regarding the presence of ground-nesting bees. • If high activity is detected in an area, avoid the area of concern. • Identify (during briefing) personnel with allergies to bee stings and ensure appropriate first aid (epipen) is available.
	Inhalation of Smoke	<ul style="list-style-type: none"> • Brief all personnel and supervisors to be aware of smoke inhalation and exposure risks. • Rotate resources when impacts to individuals begin to occur. • Assign smoke monitor to assess conditions and report to Burn Boss.
	Tool Use	<ul style="list-style-type: none"> • Crew trained to use holding tools, with supervision by squad boss. • Keep tool guards on while travelling, removing only while in use.
	Burns from Radiant Heat & Hot Embers	<ul style="list-style-type: none"> • Wear proper PPE including fire resistant clothing, hard hat, eye protection, leather boots, and gloves. • Maintain situational awareness and be mindful of jackpots of flashy fuels, and fuels with long residual burn times (down, dead logs).
	Erratic Fire Behavior	<ul style="list-style-type: none"> • Brief all personnel and supervisors prior to the burn. • All personnel will be aware of escape routes and safety zones.
	Noise from Pumps and Saws	<ul style="list-style-type: none"> • Use hearing protection (earplugs or muffs).
3a. Handling Flammable Material	Burns	<ul style="list-style-type: none"> • Use proper containers, no smoking, move away from possible ignition sources.
	Eye or Skin Exposure	<ul style="list-style-type: none"> • Wear proper PPE at all times.
3b. Operating High Pressure Nozzles	Injury	<ul style="list-style-type: none"> • Maintain visual contact with pump operator and other crew members. • Wear eye protection.

4. Ignition via drip torch or fusee.	Proximity to Intense Heat & Erratic Fire Behavior	<ul style="list-style-type: none">• Brief all personnel and supervisors prior to the burn.• Maintain good communication with lookouts and supervisors via handheld radios.• Igniters will be aware of escape routes and safety zones.• PPE.• Awareness of jackpot fuels.	
	Fatigue	<ul style="list-style-type: none">• Rotate resources into different positions to minimize fatigue.• Crew members should recognize signs of fatigue and inform fireline supervisor.• Apply work/rest ratio guidelines.	
10. LINE OFFICER SIGNATURE		11. TITLE	12. DATE
Previous edition is obsolete		(over)	

JHA Instructions (References-FSH 6709.11 and .12)

The JHA shall identify the location of the work project or activity, the name of employee(s) involved in the process, the date(s) of acknowledgment, and the name of the appropriate line officer approving the JHA. The line officer acknowledges that employees have read and understand the contents, have received the required training, and are qualified to perform the work project or activity.

Blocks 1, 2, 3, 4, 5, and 6: Self-explanatory.

Block 7: Identify all tasks and procedures associated with the work project or activity that have potential to cause injury or illness to personnel and damage to property or material. Include emergency evacuation procedures (EEP).

Block 8: Identify all known or suspect hazards associated with each respective task/procedure listed in block 7. For example:

- a. Research past accidents/incidents.
- b. Research the Health and Safety Code, FSH 6709.11 or other appropriate literature.
- c. Discuss the work project/activity with participants.
- d. Observe the work project/activity.
- e. A combination of the above.

Block 9: Identify appropriate actions to reduce or eliminate the hazards identified in block 8. Abatement measures listed below are in the order of the preferred abatement method:

- a. Engineering Controls (the most desirable method of abatement).
For example, ergonomically designed tools, equipment, and furniture.
- b. Substitution. For example, switching to high flash point, non-toxic solvents.
- c. Administrative Controls. For example, limiting exposure by reducing the work schedule; establishing appropriate procedures and practices.
- d. PPE (least desirable method of abatement). For example, using hearing protection when working with or close to portable machines (chain saws, rock drills, and portable water pumps).
- e. A combination of the above.

Block 10: The JHA must be reviewed and approved by a line officer. Attach a copy of the JHA as justification for purchase orders when procuring PPE.

Blocks 11 and 12: Self-explanatory.

Emergency Evacuation Instructions (Reference FSH 6709.11)

Work supervisors and crew members are responsible for developing and discussing field emergency evacuation procedures (EEP) and alternatives in the event a person(s) becomes seriously ill or injured at the worksite.

Be prepared to provide the following information:

- a. Nature of the accident or injury (avoid using victim's name).
- b. Type of assistance needed, if any (ground, air, or water evacuation).
- c. Location of accident or injury, best access route into the worksite (road name/number), identifiable ground/air landmarks.
- d. Radio frequencies.
- e. Contact person.
- f. Local hazards to ground vehicles or aviation.
- g. Weather conditions (wind speed & direction, visibility, temperature).
- h. Topography.
- i. Number of individuals to be transported.
- j. Estimated weight of individuals for air/water evacuation.

The items listed above serve only as guidelines for the development of emergency evacuation procedures.

JHA and Emergency Evacuation Procedures Acknowledgment

We, the undersigned work leader and crew members, acknowledge participation in the development of this JHA (as applicable) and accompanying emergency evacuation procedures. We have thoroughly discussed and understand the provisions of each of these documents:

SIGNATURE DATE

SIGNATURE DATE

E. FIRE BEHAVIOR MODELING DOCUMENTATION OR EMPIRICAL DOCUMENTATION

Fire behavior model from multiple BehavePlus 5.0.5 runs is available and on file for this burn unit. The BEHAVE Runs constitute 40 pages of data.